

## APPENDIX A

ACTUARIAL METHODOLOGY AND PRINCIPAL ASSUMPTIONS FOR  
THE HOSPITAL INSURANCE COST ESTIMATES

The basic methodology and assumptions for alternative II-A and alternative II-B used in the estimates for the hospital insurance program are described in this appendix. These alternatives reflect two different levels of expectation of future performance of the economy. In addition, sensitivity testing of program costs under alternative sets of assumptions is presented.

The economic and demographic assumptions underlying the alternative projections are described in detail in the 1988 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds. The Trustees have planned further study and review of some of the assumptions underlying the projections. The following assumptions, in particular, will be reviewed by the Trustees with regard to their appropriateness for future reports:

(1) Impact of Acquired Immune Deficiency Syndrome (AIDS) on mortality rates -- Although much about AIDS and modes of transmission of infection with the human immunodeficiency virus (HIV) is well understood, there is considerable uncertainty regarding future medical advances and the extent to which behaviors by people at risk can be modified. Death rates for AIDS were included based on estimates through 1991 prepared by the Centers for Disease Control, Public Health

Service. The Public Health Service Executive Task Force on AIDS will be developing an updated assessment of the prevalence of the HIV infection. The Trustees will consider this assessment and other evidence in order to estimate the impact of AIDS on the projections for future reports. In the interim, the assumption that no new HIV infections will occur after 1991 was adopted for this report;

(2) Annual increase in average real wages and earnings -- The Trustees have lowered the real earnings assumption from 1.5 percent for the 1987 report to 1.4 percent for the 1988 report, on the basis of accumulating evidence and the National Income and Product Account Revisions of 1985. They will study the impact of demographics and other factors on real wage increases in order to determine if further changes in this assumption are appropriate for future reports;

(3) Net immigration -- The Trustees have adopted for the intermediate alternatives the assumption that a net number of 400,000 legal and 200,000 illegal immigrants will enter the country annually for the next 75 years, reflecting best estimates of current levels. This assumption will be reexamined for future reports as the impact of recent changes in the laws affecting immigration become apparent and as data on future immigration become available; and

(4) Ultimate fertility rates -- The assumptions relating to the long-range ultimate fertility rates will be reviewed in the light of the next set of long-range population projections to be released by the Bureau of the Census.

## 1. PROGRAM COSTS

The principal steps involved in projecting the future costs of the hospital insurance program are (1) establishing the present cost of services provided to beneficiaries, by type of service, to serve as a projection base; (2) projecting increases in payment amounts for inpatient hospital services under the program; (3) projecting increases in payment amounts for skilled nursing facility and home health agency services covered under the program; and (4) projecting increases in administrative costs. The major emphasis will be directed toward expenditures for inpatient hospital services, which account for approximately 93 percent of total benefits.

### a. Projection Base

In order to establish a suitable base from which to project the future costs of the program, the incurred payments for services provided must be reconstructed for the most recent period for which a reliable determination can be made. To do this, payments to providers must be attributed to dates of service, rather than to payment dates. In addition, the nonrecurring effects of any changes in regulations, legislation, or administration of the program and of any items affecting only the timing and flow of payments to providers must be eliminated. As a result, the rates of increase in the incurred cost of the program differ from the increases in cash disbursement shown in tables 5 and 6.

For those expenses still reimbursed on a reasonable cost basis, the costs for covered services are determined on the basis of provider cost reports. Payments to a provider initially are made on an "interim" basis; to adjust interim payments to the level of retroactively determined costs, a series of payments or recoveries is

effected through the course of cost settlement with the provider. The net amounts paid to date to providers in the form of cost settlements are known; however, the incomplete data available do not permit a precise determination of the exact amounts incurred during a specific period of time. Due to the time required to obtain cost reports from providers, to verify these reports, and to perform audits (where appropriate), final settlements have lagged behind the liability for such payments of recoveries by as much as several years for some providers. Hence, the final cost of services reimbursed on a reasonable cost basis has not been completely determined for the most recent years of the program, and some degree of uncertainty remains even for earlier years.

Even for inpatient hospital operating payments paid for on the basis of diagnosis-related groups (DRGs), most payments are initially made on an interim basis, and final payments are determined on the basis of bills containing detailed diagnostic information which are later submitted by the hospital.

Additional problems are posed by changes in legislation or regulation, or in administrative or reimbursement policy, which have a substantial effect on either the amount or incidence of payment. The extent and timing of the incorporation of such changes into interim payment rates and cost settlement amounts cannot be determined precisely.

The process of allocating the various types of payments made under the program to the proper incurred period -- using incomplete data and estimates of the impact of administrative actions -- presents difficult problems, the solution to which can be only approximate. Under the circumstances, the best that can be expected is that the actual incurred cost of the program for a recent period can be estimated within a few percent. This increases the projection error directly, by incorporating any error in estimating the base year into all future years.

b. Payments for Inpatient Hospital Costs

Beginning with hospital accounting years starting on or after October 1, 1983, the hospital insurance program began paying almost all participating hospitals a prospectively determined amount for providing covered services to beneficiaries. With the exception of certain expenses (such as capital-related and medical education expenses) still reimbursed on the basis of reasonable costs as defined by law, the payment rate for each admission depends upon the DRG to which the admission belongs.

The law contemplates that the annual increase in the payment rate for each admission will be related to a hospital input price index, which measures the increase in prices for goods and services purchased by hospitals for use in providing care to hospital inpatients. For hospital accounting years beginning before October 1, 1988, the prospective payment rates have already been determined. The projections contained in this report are based on the assumption that for fiscal year 1989 and later, the prospective payment rates will be increased in accordance with Public Law 100-203, the Omnibus Budget Reconciliation Act of 1987, as described in the "Social Security Amendments since the 1987 Report" section.

Increases in aggregate payments for inpatient hospital care covered under the hospital insurance program can be analyzed into four broad categories:

(1) Labor factors -- the increase in the hospital input price index which is attributable to increases in hospital workers' hourly earnings;

(2) Non-labor factors -- the increase in the hospital input price index which is attributable to factors other than hospital workers' hourly earnings, such as the costs of energy, food, and supplies;

(3) Unit input intensity allowance -- the increase in inpatient hospital payments per admission which are in excess of those attributable to increases in the hospital input price index; and

(4) Volume of services -- the increase in total output of units of service (as measured by hospital admissions covered by the hospital insurance program).

It has been possible to isolate some of these elements and to identify their roles in previous hospital cost increases. Table A1 shows the values of the principal components of the increases for historical periods for which data are available and the projected trends used in the estimates. The following discussions apply to projections under both alternative II-A and alternative II-B, unless otherwise indicated.

Increases in hospital workers' hourly earnings can be analyzed and projected in terms of the assumed increases in hourly earnings in employment in the general economy and the difference between hourly earnings increases in the general economy and the proxy for hospital hourly earnings used in the hospital input price index.

Since the beginning of the hospital insurance program, the differential between the proxy for hospital workers' hourly earnings and hourly earnings in the general economy has fluctuated widely. Since 1975, this positive differential has averaged about 0.5 percent, as hospital workers' earnings have risen faster than general earnings. Several factors contributing to this differential can be identified, including (1) growth in third-party reimbursement of hospitals -- through Medicare, Medicaid, and comprehensive private plans -- which is likely to have weakened hospital resistance to wage demands; (2) increased proportions of highly trained and more highly paid personnel; (3) an increased degree of labor organization and activity; and (4) the fact that hospital employees had historically earned less than similarly skilled workers in other industries. During the initial years of the prospective payment system, it appears that hospital hourly earnings were depressed relative to those in the general economy as hospitals adapted to the prospective payment system. Over the short term, this differential is assumed to return to a level of one percent, declining gradually to zero by the end of the first 25-year projection period.

Increases in hospital price input intensity, which are primarily the result of price increases for goods and services that hospitals purchase which do not parallel increases in the Consumer Price Index (CPI), are measured as the difference between the non-labor component of the hospital input price index and the CPI. Although the level has fluctuated erratically in the past, this differential has averaged about 0.5 percent during 1975-1986. Over the short term, hospital price input intensity is assumed to remain at a level of one-half percent, and decline to zero by the end of the first 25-year projection period.

Public Law 100-203 prescribes that future increases in payments to participating hospitals for covered admissions in most years will equal the increase in the hospital input price index. Thus, the unit input intensity allowance, as indicated in table A1, is assumed to equal zero in most years during the first 25-year projection period. After the first 25-year projection period, the input price index plus the unit input intensity allowance is assumed to increase at the same rate as average earnings increase. For years prior to the beginning of the prospective payment system, the unit input intensity allowance has been set at one percent for illustrative purposes, with historical increases in excess of one percent allocated to other sources. For years after the beginning of the prospective payment system, the unit input intensity allowance is the allowance provided for in the prospective payment update factor.

Since the beginning of the prospective payment system, increases in inpatient hospital payments from other sources are primarily due to three factors: (1) the improvement in DRG coding as hospitals continue to adjust to the prospective payment system; (2) the trend toward treating less complicated (and thus, less expensive) cases in outpatient settings, resulting in an increase in the average prospective payment per admission; and (3) legislation affecting the payment rates. For the years 1989 through 2000, a one-half percent increase from other sources is attributable to a continuation of the current trend toward treating less complicated cases in outpatient settings. The long-term average increase from other sources is due to payments for certain costs not included in the DRG payment increasing at a rate faster than the input price index. Possible other

sources of both relative increases and decreases in payments include (1) a shift to more or less expensive admissions (DRGs) due to changes in the demographic characteristics of the covered population; (2) changes in medical practice patterns; and (3) adjustments in the relative payment levels for various DRGs or addition/deletion of DRGs in response to changes in technology. As experience under the prospective payment system develops and is analyzed, it may be possible to establish a predictable trend for this component.

Other factors which contribute to increases in payments for inpatient hospital services include increases in units of service as measured by increases in inpatient hospital admissions covered under the hospital insurance program. Increases in admissions are attributable both to increases in enrollment under the hospital insurance program and to increases in admission incidence (admissions per beneficiary). The historical and projected increases in enrollment reflect the more rapid increase in the population aged 65 and over than in the total population of the United States, and the coverage of certain disabled beneficiaries and persons with end-stage renal disease. Increases in the enrollment are expected to continue, reflecting a continuation of the demographic shift into categories of the population which are eligible for hospital insurance protection. In addition, increases in the average age of beneficiaries lead to higher levels of admission incidence.

c. Skilled Nursing Facility and Home Health Agency Costs

Historical experience with the number of days of care covered in skilled nursing facilities under the hospital insurance program has been characterized by wide swings. The number of covered days dropped very sharply in 1970 and continued to decline through 1972. This was the result of strict enforcement of regulations separating skilled nursing care from custodial care. Because of the small fraction of nursing home care covered under the program, this reduction primarily reflected the determination that Medicare was not liable for payment rather than reduced usage of services. The 1972 amendments extended benefits to persons who require skilled rehabilitative services regardless of their need for skilled nursing services (the former prerequisite for benefits). This change and subsequent related changes in regulations have resulted in significant increases in the number of services covered by the program. Recent data have indicated fluctuations in utilization of these services; modest increases are projected.

Increases in the average cost per day in skilled nursing facilities under the program are caused principally by increasing payroll costs for nurses and other skilled labor required. Projected rates of increase are assumed to be about the same as increases in general earnings throughout the projection period. The resulting increases in the cost of skilled nursing facility services are shown in table A2.

Program experience with home health agency costs has shown a generally upward trend. The number of visits had increased sharply from year to year but recent increases have been smaller. Modest increases are projected, similar to that for skilled nursing facilities. Cost per service is assumed to increase at about the same rate as increases in general earnings. The resulting home health agency cost increases are shown in table A2.

d. Administrative Expenses

The costs of administering the hospital insurance program have remained relatively small, in comparison with benefit amounts, throughout the history of the program. The ratio of administrative expenses to benefit payments has generally fallen within the range of 1 to 3 percent. The short-range projection of administrative cost is based on estimates of workloads and approved budgets for intermediaries and the Health Care Financing Administration. In the long range, administrative cost increases are based on assumed increases in workloads, primarily due to growth and aging of the population, and on assumed unit cost increases of slightly less than the increases in average hourly earnings shown in table A1.

## 2. FINANCING

In order to analyze costs and to evaluate the financing of a program supported by payroll taxes, program costs must be compared on a year-by-year basis with the taxable payroll which provides the source of income for these costs.

Since the vast majority of total program costs are related to insured beneficiaries and since general revenue appropriations and premium payments are available to support the uninsured segments, the remainder of this report will focus on the financing for insured beneficiaries.

a. Taxable Payroll

Taxable payroll increases can be separated into a part due to increases in covered earnings and a part due to increases in the number of covered workers. The taxable payroll projection used in this report is based on economic assumptions consistent with those used in the OASDI report. Increases in taxable payroll assumed for this report are shown in table A2.

b. Relationship Between Program Costs and Taxable Payroll

The single most meaningful measure of program cost increases, with reference to the financing of the system, is the relationship between program cost increases and taxable payroll increases. If the rates of increase in both series are the same, a level tax rate over time will be adequate to support the program. However, to the extent that program costs increase more rapidly than taxable payroll, either a schedule of increasing tax rates or a reduction in program costs will be required to finance the system over time. Table A2 shows the resulting increases in program costs relative to taxable payroll over the first 25-year projection period. These relative increases reduce gradually to a level of approximately 0.7 percent and 0.9

percent per year by 2010, but increase to a level of approximately 1.6 percent and 1.8 percent per year by 2012 for alternatives II-A and II-B, respectively, due to the post-World War II "baby boom" becoming eligible for benefits. The result of these increases is a continued increase in the year-by-year ratios of program expenditures to taxable payroll, as shown in table A3.

### 3. SENSITIVITY TESTING OF COSTS UNDER ALTERNATIVE ASSUMPTIONS

Over the past 20 years, aggregate inpatient hospital costs for Medicare beneficiaries have increased substantially faster than increases in average earnings and prices in the general economy. Table A1 shows the experience of the HI program for 1975 to 1986. As mentioned earlier, the HI program now makes payments to most participating hospitals on a prospective basis (with the exception of certain expenses). Thus, the trends in aggregate HI inpatient hospital costs prior to 1983, as shown in the historical section of table A1, have little relation to the projected HI inpatient hospital payments. The prospective payment system has made the outlays of the HI program potentially less vulnerable to excessive rates of growth in the hospital industry. However, there is some uncertainty in projecting HI expenditures due to the uncertainty of the underlying economic assumptions and utilization increases. In addition, there is some uncertainty in projecting HI inpatient hospital payments due to the possibility of future legislation affecting the payment levels to hospitals.

In view of the uncertainty of future cost trends, projected costs for the hospital insurance program have been prepared under four alternative sets of assumptions. A summary of the assumptions and results is shown in table A3. The sets of assumptions labeled "Alternative II-A" and "Alternative II-B" form the basis for the detailed discussion of hospital cost trends and resulting program costs presented throughout this report. They represent intermediate sets of cost increase assumptions, compared with the lower cost and more optimistic alternative I and the higher cost and less optimistic alternative III. Increases in the economic factors (average hourly earnings and CPI) for the four alternatives are consistent with those underlying the OASDI report.

As noted earlier, the single most meaningful measure of hospital insurance program cost increases, with reference to the financing of the system, is the relationship between program cost increases and taxable payroll increases. The extent to which program cost increases exceed increases in taxable payroll will determine how steeply tax rates must be increased or program costs curtailed to finance the system over time.

By the end of the first 25-year projection period, program costs are projected to increase about 1.6 percent and 1.8 percent faster than increases in taxable payroll for alternatives II-A and II-B, respectively, as discussed in the "Financing" section of this appendix. Program costs beyond the first 25-year projection period are based on the assumption that costs per unit of service will increase at the same rate as earnings increase. Program expenditures, which are currently about 2.5

percent of taxable payroll, increase to a level of about 4 percent by the year 2012 under both alternatives II-A and II-B and to about 7 percent by the year 2062. Hence, if all of the projection assumptions are realized over time, hospital insurance tax rates provided in the present financing schedule (2.9 percent of taxable payroll) will be inadequate to support the cost of the program.

During the first 25-year projection period, alternatives I and III contain assumptions which result in program costs increasing, relative to taxable payroll increases, approximately 2 percent less rapidly and 2 percent more rapidly, respectively, than the results under both sets of intermediate assumptions. Costs beyond the first 25-year projection period assume the 2 percent differential gradually decreases until the year 2037 when program cost increases relative to taxable payroll are approximately the same as under both sets of intermediate assumptions. Under alternative I, program costs increase slightly more than increases in taxable payroll during the first 25-year projection period. Program expenditures under this alternative would be about 2.7 percent of taxable payroll in the year 2012, increasing to about 3.6 percent of taxable payroll by 2062. The average program costs for the 75-year projection period are about 3.0 percent of taxable payroll; hence, hospital insurance tax rates provided in the present financing schedule will be inadequate even under the optimistic alternative I assumptions. Under alternative III, program costs increase about 3.8 percent more rapidly than increases in taxable payroll during the first 25-year projection period. The result of this differential is a level of program expenditures in the year 2012 which is about 6.4 percent of taxable payroll, increasing to about 14.2 percent of taxable payroll in the year 2062.

TABLE A1.—COMPONENTS OF HISTORICAL AND PROJECTED INCREASES IN HI INPATIENT HOSPITAL PAYMENTS 1/  
(Percent)

Calendar year	Labor			Non-labor			Units of service			Other sources	HI inpatient hospital payments	
	Average hourly earnings	Hospital hourly earnings level	Hospital hourly earnings	CPI	Hospital price input intensity	Non-labor hospital prices	Input price index	Unit input intensity allowance 2/	HI enrollment			Admission incidence
Historical Data:												
1975	8.2%	0.6%	8.8%	9.1%	3.5%	12.9%	10.5%	1.0%	3.4%	0.1%	6.1%	22.5%
1976	7.8	-0.2	7.6	5.7	1.7	7.5	7.6	1.0	2.9	1.5	5.1	19.2
1977	6.8	0.0	6.8	6.5	0.6	7.1	6.9	1.0	3.0	4.6	0.8	17.2
1978	8.0	-0.3	7.7	7.6	-0.8	6.7	7.3	1.0	2.7	-1.9	5.3	14.9
1979	8.5	-0.6	7.8	11.4	-1.1	10.2	8.8	1.0	2.7	3.1	0.2	16.5
1980	7.7	1.9	9.7	13.5	0.7	14.3	11.7	1.0	2.1	2.4	2.5	20.8
1981	9.0	1.2	10.3	10.3	-0.5	9.8	10.1	1.0	1.9	2.7	3.0	19.7
1982	5.9	2.8	8.9	6.0	0.3	6.3	7.7	1.0	1.8	0.0	4.6	15.7
1983	4.5	1.7	6.3	3.0	1.2	4.2	5.4	1.0	1.7	1.1	1.7	11.3
1984	5.8	-0.3	5.5	3.4	0.7	4.1	4.9	1.0	1.8	-3.9	7.1	11.0
1985	4.7	-0.3	4.4	3.5	-0.5	3.0	3.8	0.0	1.6	-7.4	8.7	6.2
1986	5.2	-1.5	3.6	1.6	-0.1	1.5	2.7	-2.6	1.9	-3.2	5.5	4.2
Projection:												
Alternative II-A												
1987	4.3	-0.2	4.1	3.6	0.0	3.6	3.9	-2.6	2.0	-1.9	2.1	3.5
1988	3.1	1.7	4.9	3.6	0.7	4.3	4.6	-2.4	2.2	0.0	0.4	4.9
1989	4.8	1.0	5.8	3.9	0.5	4.4	5.2	-1.5	2.2	1.5	0.6	8.2
1990	4.9	1.0	5.9	3.6	0.5	4.1	5.2	0.0	1.9	1.8	2.0	11.3
1995	4.6	1.0	5.6	3.0	0.5	3.5	4.8	0.0	1.4	1.3	0.4	8.1
2000	4.9	1.0	5.9	3.0	0.5	3.5	5.0	0.0	0.8	0.9	0.5	7.3
2005	4.9	0.5	5.4	3.0	0.5	3.5	4.8	0.0	1.2	0.5	0.0	6.6
2010	5.0	0.0	5.0	3.0	0.5	3.5	4.5	0.0	1.7	-0.2	0.0	6.1
2012	5.0	0.0	5.0	3.0	0.0	3.0	4.4	0.0	2.9	-0.5	-0.1	6.8
Alternative II-B												
1987	4.3	-0.2	4.1	3.6	0.0	3.6	3.9	-2.6	2.0	-1.9	2.1	3.5
1988	2.8	2.0	4.9	3.9	0.4	4.3	4.6	-2.4	2.2	0.0	0.5	5.0
1989	4.7	1.0	5.7	4.5	0.5	5.0	5.4	-1.5	2.2	1.5	0.5	8.3
1990	4.8	1.0	5.8	4.3	0.5	4.8	5.4	0.0	1.9	1.8	2.1	11.6
1995	5.4	1.0	6.5	4.0	0.5	4.5	5.7	0.0	1.4	1.3	0.4	9.0
2000	5.5	1.0	6.6	4.0	0.5	4.5	5.8	0.0	0.8	0.9	0.5	8.1
2005	5.5	0.5	6.0	4.0	0.5	4.5	5.5	0.0	1.2	0.5	0.0	7.3
2010	5.6	0.0	5.6	4.0	0.5	4.5	5.2	0.0	1.7	-0.2	0.0	6.8
2012	5.6	0.0	5.6	4.0	0.0	4.0	5.1	0.0	2.9	-0.5	-0.1	7.5

1/ Percent increase in year indicated over previous year, on an incurred basis.

2/ Reflects the allowances provided for in the prospective payment update factors.

NOTE: Historical and projected data reflect a recalibration of the hospital input price index which occurred in 1986.

TABLE A2.--RELATIONSHIP BETWEEN INCREASES IN HI PROGRAM EXPENDITURES AND INCREASES IN TAXABLE PAYROLL 1/  
(Percent)

<u>Calendar year</u>	<u>Inpatient hospital 2/ 3/</u>	<u>Skilled nursing facility 3/</u>	<u>Home health agency 3/</u>	<u>Weighted average 3/ 4/</u>	<u>HI administrative costs 3/ 5/</u>	<u>HI program expenditures 3/</u>	<u>HI taxable payroll</u>	<u>Ratio of expenditures to payrolls 6/</u>
Alternative II-A								
1988	5.1%	9.0%	7.6%	5.3%	18.7%	5.6%	6.1%	-0.5%
1989	8.3	9.7	9.0	8.4	8.7	8.4	6.4	1.9
1990	11.5	9.1	8.8	11.4	8.7	11.3	6.4	4.6
1995	8.2	7.2	7.5	8.2	6.8	8.2	5.7	2.3
2000	7.3	6.7	7.0	7.4	5.8	7.3	5.7	1.5
2005	6.6	6.6	6.6	6.7	5.6	6.6	5.6	1.0
2010	6.1	6.3	6.1	6.1	5.4	6.1	5.3	0.7
2012	6.8	6.8	6.6	6.8	6.3	6.8	5.1	1.6
Alternative II-B								
1988	5.1	8.3	7.1	5.3	18.7	5.6	5.8	-0.2
1989	8.5	9.7	9.0	8.6	8.5	8.6	6.1	2.3
1990	11.7	8.2	8.4	11.6	8.5	11.5	6.0	5.2
1995	9.1	7.6	8.0	9.0	7.4	9.0	6.3	2.5
2000	8.1	7.3	7.4	8.1	6.3	8.0	6.2	1.8
2005	7.3	7.0	7.1	7.3	6.2	7.3	6.1	1.2
2010	6.8	6.6	6.6	6.8	5.9	6.8	5.8	0.9
2012	7.5	7.3	7.1	7.5	6.8	7.5	5.7	1.8

1/ Percent increase in year indicated over previous year.

2/ This column differs slightly from the last column of table A1, since table A1 includes all persons eligible for HI protection while this table excludes noninsured persons.

3/ Costs attributable to insured beneficiaries only, on an incurred basis. Benefits and administrative costs for noninsured persons are financed through general revenue transfers and premium payments, rather than through payroll taxes.

4/ Includes costs for hospice care, as provided for by the Tax Equity and Fiscal Responsibility Act of 1982 as amended by the Consolidated Omnibus Budget Reconciliation Act of 1985.

5/ Includes costs of Peer Review Organizations.

6/ Percent increase in the ratio of program expenditures to taxable payroll. This is equivalent to the differential between the increase in program costs and the increase in taxable payroll.

NOTE: Taxable payroll is adjusted to take into account the lower contribution rates on multiple-employer "excess wages," as compared with the combined employer-employee rate.

TABLE A3.--SUMMARY OF ALTERNATIVE PROJECTIONS FOR THE HOSPITAL INSURANCE PROGRAM  
(Percent)

Calendar year	Increases in aggregate HI inpatient hospital payments 1/				Changes in the relationship between expenditures and payroll 1/			Expenditures as a percent of taxable payroll 3/ 4/
	Average hourly earnings	CPI	Other factors 2/	Total 3/	Program expenditures 3/ 4/	Taxable payroll	Ratio of expenditures to payroll	
ALTERNATIVE I								
1988	3.2%	3.3%	1.3%	4.6%	5.2%	6.5%	-1.1%	2.50%
1989	4.6	3.2	2.6	6.7	7.1	6.6	0.5	2.51
1990	4.7	3.0	5.7	9.9	10.0	6.4	3.3	2.59
1995	3.9	2.0	2.5	5.7	5.9	5.1	0.7	2.72
2000	4.3	2.0	1.7	5.2	5.4	5.4	0.0	2.75
2005	4.4	2.0	0.8	4.4	4.6	5.2	-0.6	2.70
2010	4.4	2.0	0.3	3.9	4.1	5.0	-0.8	2.67
2012	4.4	2.0	0.9	4.6	4.8	4.8	0.0	2.65
ALTERNATIVE II-A								
1988	3.1	3.6	1.5	4.9	5.6	6.1	-0.5	2.51
1989	4.8	3.9	3.6	8.2	8.4	6.4	1.9	2.56
1990	4.9	3.6	6.7	11.3	11.3	6.4	4.6	2.68
1995	4.6	3.0	4.0	8.1	8.2	5.7	2.3	3.03
2000	4.9	3.0	3.0	7.3	7.3	5.7	1.5	3.31
2005	4.9	3.0	2.2	6.6	6.6	5.6	1.0	3.53
2010	5.0	3.0	1.7	6.1	6.1	5.3	0.7	3.77
2012	5.0	3.0	2.3	6.8	6.8	5.1	1.6	3.87
ALTERNATIVE II-B								
1988	2.8	3.9	1.7	5.0	5.6	5.8	-0.2	2.52
1989	4.7	4.5	3.5	8.3	8.6	6.1	2.3	2.58
1990	4.8	4.3	6.7	11.6	11.5	6.0	5.2	2.71
1995	5.4	4.0	4.0	9.0	9.0	6.3	2.5	3.11
2000	5.5	4.0	3.0	8.1	8.0	6.2	1.8	3.42
2005	5.5	4.0	2.2	7.3	7.3	6.1	1.2	3.68
2010	5.6	4.0	1.7	6.8	6.8	5.8	0.9	3.96
2012	5.6	4.0	2.3	7.5	7.5	5.7	1.8	4.07
ALTERNATIVE III								
1988	2.0	4.4	2.0	5.1	5.6	4.3	1.2	2.56
1989	4.8	5.9	3.7	9.2	9.4	4.5	4.7	2.68
1990	6.0	6.4	7.4	14.0	13.8	6.8	6.6	2.85
1995	5.9	5.0	6.1	12.0	11.8	7.4	4.2	3.57
2000	6.2	5.0	4.6	10.6	10.4	6.5	3.7	4.31
2005	6.2	5.0	3.8	9.8	9.7	6.5	3.0	5.06
2010	6.2	5.0	3.2	9.2	9.1	6.2	2.8	5.98
2012	6.3	5.0	3.9	10.0	9.8	6.0	3.7	6.38

1/ Percent increase in the year indicated over the previous year.

2/ Other factors include hospital hourly earnings, hospital price input intensity, unit input intensity allowance, and units of service as measured by admissions.

3/ On an incurred basis.

4/ Includes expenditures attributable to insured beneficiaries only.

NOTE: Taxable payroll is adjusted to take into account the lower contribution rates on multiple-employer "excess wages," as compared with the combined employer-employee rate.

## APPENDIX B

DETERMINATION AND ANNOUNCEMENT OF THE MEDICARE PART A (HOSPITAL INSURANCE) INPATIENT HOSPITAL DEDUCTIBLE AND MONTHLY PREMIUM RATE FOR THE UNINSURED AGED, FOR CALENDAR YEAR 1988 1/I. Inpatient Hospital Deductible and Coinsurance Amounts

Section 1813 of the Social Security Act (the Act) (42 U.S.C. 1395(e)) provides for an inpatient hospital deductible and certain coinsurance amounts to be deducted from the amount payable by Medicare for inpatient hospital services and extended care services furnished an individual. Section 1813(b)(2) of the Act, as amended by section 9301 of the Omnibus Budget Reconciliation Act (OBRA) of 1986, Pub. L. 99-509, requires the Secretary to determine and publish by September 15 of each year the amount of the inpatient hospital deductible applicable for the following calendar year.

The 1988 inpatient hospital deductible and coinsurance amounts discussed below have been computed as required by section 1813 of the Act. The costs associated with this notice are the result of legislative requirements implemented by this notice. The amount of the deductible for 1988 under the formula has been determined to be \$540. This represents a 4 percent increase over the deductible for 1987, which was \$520. The 1987 deductible had increased 6 percent over that for 1986. The \$520 amount for 1987 was prescribed by Congress in section 1813(b)(1) of the Social Security Act, as amended by section 9301 of OBRA.

1/ Extracted from the notice entitled "Medicare Program; Inpatient Hospital Deductible and Coinsurance Amounts and Part A Premium for the Uninsured Aged for 1988," which was published in the Federal Register on September 16, 1987 (Vol. 52, No. 179, p. 35056).

Section 9301 of Pub. L. 99-509 amended section 1813 of the Act to establish a new method for computing the amount of the inpatient hospital deductible. Under the formula specified in the law, the deductible for calendar year 1988 must be equal to \$520 (the deductible for the preceding year) multiplied by the percentage increase (that is, the update factor) for the prospective payment rates for inpatient hospital services effective October 1, 1987, and adjusted to reflect real case mix. The amount so determined is rounded to the nearest multiple of \$4.

The applicable percentage increase for Medicare prospective payment rates is 2.7 percent, as announced in the Federal Register on September 1, 1987 (52 FR 33034). The case-mix adjustment factor is 1.46 percent.

A case-mix index is calculated for each hospital reflecting the relative costliness of that hospital's mix of cases compared to a national average mix of cases. We computed the increase in average case mix for hospitals paid under the Medicare prospective payment system (PPS) in fiscal year 1987. We used PPS bills available to us as of the end of July 1987. This is a total of about 6 million discharges for FY 1987. The increase in average case mix in FY 1987 is computed to be 1.46 percent.

In the June 11, 1987 notice of the Secretary's recommended update for PPS hospitals (52 FR 22386), we made no adjustment to the update factor for case mix, since at that time the data indicated an increase in case mix of 0.6 percent in FY 1987, which was small compared to increases in prior years. We considered all of this increase as due to changes in real case mix. Even

though the measure of case-mix increase for FY 1987 has increased to 1.46 percent, we did not recommend any adjustment to the PPS update for FY 1988. Hence, we considered all of the 1.46 percent increase as changes in real case mix. By law, we must increase the deductible by the real case-mix increase of 1.46 percent.

Thus, the inpatient hospital deductible for calendar year 1988 is \$520 times 1.027 times 1.0146, which equals \$541.84 and is rounded to \$540.

Because the coinsurance amounts in section 1813 of the Act are fixed percentages of the inpatient hospital deductible for services furnished in the same calendar year, the increase in the deductible has the effect of also increasing the amount of coinsurance the Medicare beneficiary must pay. Thus, for inpatient hospital services or extended care services furnished in 1988, the daily coinsurance for the 61st through 90th days of hospitalization (1/4 of the inpatient hospital deductible) will be \$135; the daily coinsurance for lifetime reserve days (1/2 of the inpatient hospital deductible) will be \$270; and the daily coinsurance for the 21st through 100th days of extended care services in a skilled nursing facility (1/8 of the inpatient hospital deductible) will be \$67.50.

The estimated cost to beneficiaries due to these increases is \$200 million. This amount is based on an estimated 7.3 million beneficiaries who will have 7.9 million benefit periods and use 2.9 million hospital coinsurance days, 1.1 million lifetime reserve days, and 4.2 million skilled nursing facility coinsurance days in 1988.

## II. Part A Premium for the Uninsured Aged

Under the authority in section 1818(d)(2) of the Social Security Act (42 U.S.C. 1395i-2(d)(2)), I have determined that the monthly Medicare hospital insurance premium for the uninsured aged for the 12 months beginning January 1, 1988 is \$234.

Section 1818 of the Social Security Act (Act) provides for voluntary enrollment in the hospital insurance program (Part A of Medicare), subject to payment of a monthly premium, of certain persons age 65 and older who are uninsured for social security or railroad retirement benefits and do not otherwise meet the requirements for entitlement to hospital insurance. (Persons insured under the Social Security or Railroad Retirement Acts need not pay premiums for hospital insurance.)

The formula specified in this section requires that, for the period beginning January 1, 1988, the 1973 base year premium (\$33) be multiplied by the ratio of (1) the 1988 inpatient hospital deductible to (2) the 1973 inpatient hospital deductible, rounded to the nearest multiple of \$1, or, if midway between multiples of \$1, to the next higher multiple of \$1.

Under section 1813(b)(2) of the Act, the 1988 inpatient hospital deductible was determined to be \$540. The 1973 deductible was actuarially determined to be \$76, although the 1973 deductible was actually promulgated to be only \$72, to comply with a ruling of the Cost of Living Council. (See 37 FR 21452, October 11, 1972.) The monthly premium for the 12-month period beginning January 1, 1988 has been calculated using the \$76 deductible for 1973, since this more closely satisfies the intent of the law. Thus, the monthly hospital insurance premium is  $\$33 \times (540/76) = \$234.47$ , which is rounded to \$234.

The monthly hospital insurance premium for the uninsured aged for the 12-month period beginning January 1, 1988, will increase to \$234. That amount is 4 percent higher than the \$226 monthly premium amount for the 12-month period beginning January 1, 1987.

The estimated cost of this increase to the approximately 18 thousand enrollees who do not otherwise meet the requirements for entitlement to hospital insurance will be about \$2 million.

III. Regulatory Impact Statement

This notice merely announces amounts required by legislation. This notice is not a proposed rule or a final rule issued after a proposal, and does not alter any regulation or policy. Therefore, we have determined, and the Secretary certifies, that no analyses are required under Executive Order 12291 or the Regulatory Flexibility Act (5 U.S.C. 601 through 612).

Dated: September 10, 1987

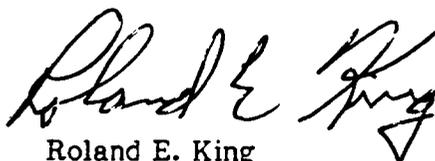
William L. Roper  
Administrator  
Health Care Financing Administration

Approved: September 11, 1987

Otis R. Bowen  
Secretary  
Department of Health and Human  
Services

APPENDIX C  
STATEMENT OF ACTUARIAL OPINION

It is my opinion that the methodology used herein is based upon sound principles of actuarial practice. With regard to the assumptions used, I strongly concur with the Trustees' intent to review several of the assumptions with regard to their appropriateness. This intent is expressed on pages 53 and 54 of this report and in the 1988 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds. With regard to the resulting cost estimates, it is my opinion that the most appropriate measure of the full cost of the program includes the cost for maintaining a balance in the trust fund equal to a minimum of one-half year's expenditures.



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